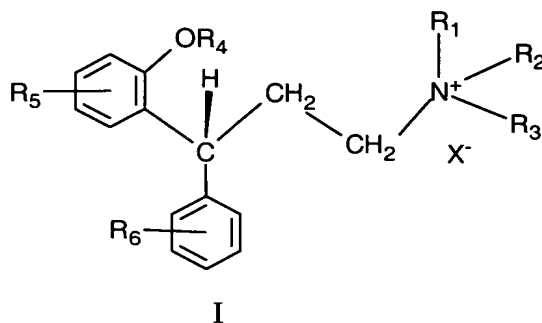


What is claimed is:

1. A method of treating IBS in a mammal, comprising administering a therapeutically acceptable amount of a compound of formula I



and the enantiomer thereof

wherein each R₁, R₂, and R₃ is independently H, C₁-C₅ alkyl optionally substituted with phenyl, or C₂-C₆ alkenyl, or wherein two of R₁, R₂ and R₃ may form a ring together with the quaternary ammonium nitrogen.

where R₄ is

-H,

-CO-R₄₋₁ where R₄₋₁ is

C₁-C₄ alkyl,

C₁-C₄ alkoxy,

-NR₄₋₂R₄₋₃ where R₄₋₂ and R₄₋₃ are the same or different and

are -H or C₁-C₄ alkyl,

where R₅ and R₆ are the same or different and are

-H,

C₁-C₄ alkyl optionally substituted with 1 or 2

-OH,

C₁-C₄ alkoxy,

-COOH,

-CO-O-(C₁-C₃ alkoxy)

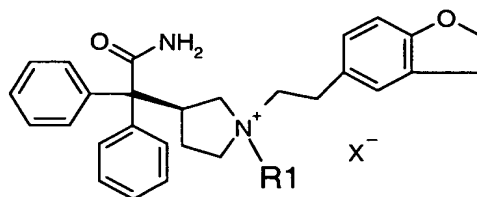
-F, -Cl, Br,

-CF₃,

where X^- is selected from the group consisting of the anions of the following acids hydrochloric, hydrobromic, hydroiodic, sulfuric, phosphoric, nitric, citric, methanesulfonic $CH_3-(CH_2)_{n_1}-COOH$ where n_1 is 0 thru 4, $HOOC-(CH_2)_{n_1}-COOH$ where n is as defined above, $HOOC-CH=CH-COOH$, $\phi-COOH$.

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2. A method of treating IBS in a mammal, comprising administering a therapeutically acceptable amount of a compound of formula II



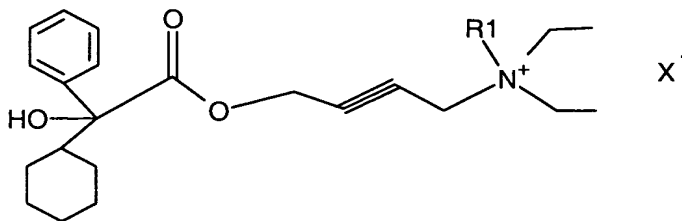
II

10 and any stereoisomers thereof, wherein

R_1 is selected from C_1-C_6 alkyl, $-CH_2-(C_1-C_4$ alkenyl), and $-CH_2-(C_1-C_6$ alkynyl), each of which is optionally substituted with a group selected from phenyl, C_1-C_4 alkoxy, and hydroxyl; and

X represents an anion of a pharmaceutically acceptable acid.

15 3. A method of treating IBS in a mammal, comprising administering a therapeutically acceptable amount of a compound of formula III



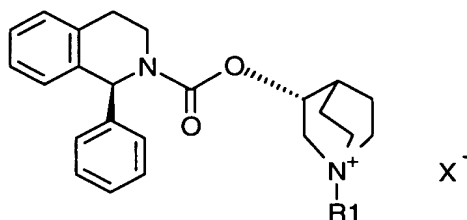
III

and any stereoisomers thereof, wherein

20 R_1 is selected from C_1-C_6 alkyl, $-CH_2-(C_1-C_4$ alkenyl), and $-CH_2-(C_1-C_6$ alkynyl), each of which is optionally substituted with a group selected from phenyl, C_1-C_4 alkoxy, and hydroxyl; and

X represents an anion of a pharmaceutically acceptable acid.

4. A method of treating IBS in a mammal, comprising administering a therapeutically acceptable amount of a compound of formula IV



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IV

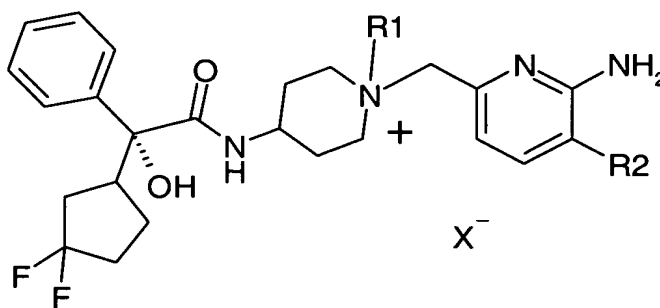
and any stereoisomers thereof, wherein

- R₁ is selected from C₁-C₆ alkyl, -CH₂-(C₁-C₄ alkenyl), and -CH₂-(C₁-C₆ alkynyl), each of which is optionally substituted with a group selected from phenyl, C₁-C₄ alkoxy, and hydroxyl; and

10

X represents an anion of a pharmaceutically acceptable acid.

5. A method of treating IBS in a mammal, comprising administering a therapeutically acceptable amount of a compound of formula V



15

V

and any stereoisomers thereof, wherein

- R₁ is selected from C₁-C₆ alkyl, -CH₂-(C₁-C₄ alkenyl), and -CH₂-(C₁-C₆ alkynyl), each of which is optionally substituted with a group selected from phenyl,

C₁-C₄ alkoxy, and hydroxyl;

R₂ is selected from H or OH; and

X represents an anion of a pharmaceutically acceptable acid.

- 5 6. The method of any of claims 1-5, wherein X is selected from the group consisting of the anions of the following acids: tartaric, hydrochloric, hydrobromic, hydroiodic, sulfuric, phosphoric, nitric, citric, methanesulfonic, CH₃-(CH₂)_n-COOH where n is 0-4, HOOC-(CH₂)_n-COOH where n is 1-4, HOOC-CH=CH-COOH, and benzoic.

10

7. The method of any of claims 1-5, wherein X is selected from the group consisting of iodide, bromide, and chloride.

8. The method of any of claims 1-5, wherein compound of formula I, II, III, IV,
15 or V is a component of a pharmaceutical composition.

9. The method of claim 8, wherein the pharmaceutical composition comprises between about 1 mg and about 1000 mg of the compound of the formula I, II, III, IV, or V.

20

10. The method of claim 9, wherein the pharmaceutical composition comprises between about 200 mg and about 800 mg of the compound of the formula I, II, III, IV, or V.

- 25 11. The method of claim 9, wherein the pharmaceutical composition comprises about 600 mg of the compound of the formula I, II, III, IV, or V.

12. The method of any of claims 1-5, wherein the compound of the formula I, II, III, IV, or V is administered orally.

30

13. The method of claim 12, wherein the compound of formula I, II, III, IV, or V is , a component of a tablet or capsule.
14. The method of any of claims 1-5, wherein the compound of the formula I, II,
5 III, IV, or V.is administered as a component of a suppository.
15. The method of any of claims 1-5, wherein the compound of the formula I, II, III, IV, or V.is administered a component of an enema.
- 10 16. The method of any of claims 1-5, wherein the therapeutically effective amount of the compound of formula I, II, III, IV, or V, or mixtures thereof, are administered to a mammal in an amount from about 0.1 to about 100 mg/kg of mammal body weight /day.
- 15 17. The method of claim 16, wherein the therapeutically effective amount of the compound of formula I, II, III, IV, or V, or mixtures thereof, administered to a mammal is about 600 mg per day.
18. The method of any of claims 1-5, wherein administering the therapeutically
20 effective amount includes administering a compound of formula I, II, III, IV, or V, or mixtures thereof, in one or more doses per day.
19. The method of any of claims 1-5, wherein the compound of formula I, II, III, IV, or V is selected from
- 25 (3R)-3-(2-Hydroxy-5-methylphenyl)-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium iodide;
(3R)-3-(2-Hydroxy-5-methylphenyl)-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium bromide;
(3R)-N-Ethyl-3-(2-hydroxy-5-methylphenyl)-N,N-diisopropyl-3-phenylpropan-1-
30 aminium iodide;

- (3R)-3-(2-Hydroxy-5-methylphenyl)-N,N-diisopropyl-3-phenyl-N-propylpropan-1-aminium iodide;
- (3R)-N-Benzyl-3-(2-hydroxy-5-methylphenyl)-N,N-diisopropyl-3-phenylpropan-1-aminium iodide;
- 5 (3R)-N-(tert-Butyl)-3-(2-hydroxy-5-methylphenyl)-N,N-dimethyl-3-phenylpropan-1-aminium bromide;
- (3R)-3-[2-hydroxy-5-(hydroxymethyl)phenyl]-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium iodide;
- (3R)-3-(2-hydroxyphenyl)-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium
10 bromide;
- (3S)-3-(2-hydroxyphenyl)-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium bromide;
- (3R)-3-(5-Chloro-2-hydroxyphenyl)-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium bromide;
- 15 (3R)-3-(5-Bromo-2-hydroxyphenyl)-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium bromide;
- (3R)-3-[2-(acetyloxy)-5-methylphenyl]-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium iodide;
- (3R)-3-[2-(isobutyryloxy)-5-methylphenyl]-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium iodide;
- 20 (3R)-3-(4-Fluorophenyl)-3-(2-hydroxy-5-methylphenyl)-N,N-diisopropyl-N-methylpropan-1-aminium bromide;
- (3R)-3-[2-hydroxy-5-(trifluoromethyl)phenyl]-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium bromide;
- 25 (3R)-3-[2-(isobutyryloxy)-5-hydroxymethylphenyl]-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminium bromide;
- (3R)-3-{2-(Acetyloxy)-5-[(acetyloxy)methyl]phenyl}-N,N-diisopropyl-N-methyl-3-phenylpropan-1-aminiumbromide;
- 2-{(1R)-3-[diisopropyl(methyl)ammonio]-1-phenylpropyl}-4-methylbenzenolate;

- 1-[3-(2-Hydroxy-5-methylphenyl)-3-phenylpropyl]-1-(2-methylprop-2-enyl)pyrrolidinium Bromide;
1-[3-(2-Hydroxy-5-methylphenyl)-3-phenylpropyl]-1-(3-methylbut-2-enyl)pyrrolidinium Bromide;
- 5 1-Allyl-1-[3-(2-hydroxy-5-methylphenyl)-3-phenylpropyl] pyrrolidinium Iodide;
1-Allyl-1-[3-(2-hydroxy-5-methylphenyl)-3-phenylpropyl] pyrrolidinium Chloride;
3-(2-Hydroxy-5-methylphenyl)-N,N-diallyl-N-methyl-3-phenyl propan-1-aminium Iodide;
3-(2-Hydroxy-5-methylphenyl)-N,N-diallyl-N-ethyl-3-phenylpropan-1-aminium Iodide;
- 10 1-Allyl-1-[3-(2-hydroxy-5-methylphenyl)-3-phenyl propyl]piperidinium Chloride;
3-(2-Hydroxy-5-methylphenyl)-N,N,N-triallyl-3-phenylpropan-1-aminium Bromide;
(3S)-3-(2-amino-2-oxo-1,1-diphenylethyl)-1-[2-(2,3-dihydro-1-benzofuran-5-yl)ethyl]-1-methylpyrrolidinium iodide;
- 15 4-(diethylmethylaminium)-2- butynyl alpha phenyl cyclohexane glycolate iodide;
3-methyl-3-QUINUCLIDINYL 1-PHENYL-2-ISOINDOLINECARBOXYLATE;
and
(2R)-N-[1-(6-aminopyridin-2-ylmethyl)1-methylpiperdin-4-yl]-2-[(1R)-3,3,-difluorocyclopentyl]-2-hydroxy-2-phenylacetamide iodide.
- 20
20. The method of any one of claims 1-5, wherein the compound of formula I, II, III, IV, or V inhibits gut motility by at least about 10%.
21. The method of any one of claims 1-5, wherein the compound of formula I, II, III, IV, or V inhibits gut motility by at least about 20%.
- 25
22. The method of any one of claims 1-5, wherein the compound of formula I, II, III, IV, or V inhibits gut motility by at least about 30%.